

Math 1432

Exam 2 Review KEY

1. a. $\frac{23}{2}$ b. $\frac{13}{6}$ c. see Monday's notes d. 0
2. a. see Monday's notes b. $AV = -\frac{3}{2}, c = \frac{-3 \pm \sqrt{3}}{2}$ c. $AV = -\frac{8}{3}, c = \pm \frac{2}{\sqrt{3}}$
3. a. $\frac{3}{2}$ b. $\frac{32}{3}$ c. Monday's notes d. Wednesday's notes
4. a. this has two regions – you will not need to find a centroid for one like this
 b. $\left(0, \frac{7}{5}\right)$ c. $\left(\frac{2a^2}{5}, \frac{a}{2}\right)$ d. don't do this one
5. $\frac{64}{3}$
6. $V = \int_0^4 \pi(x^2)^2 dx$
7. $V = \int_0^4 2\pi x(x^2) dx$
8. Wednesday's notes
9. a. $V = \int_0^2 \pi(x^2)^2 dx + \int_2^6 \pi(6-x)^2 dx$ or $\int_0^4 2\pi y(6-y-\sqrt{y}) dy$
 b. $V = \int_0^2 2\pi x(x^2) dx + \int_2^6 2\pi x(6-x) dx$ or $\int_0^4 \pi((6-y)^2 - (\sqrt{y})^2) dy$
10. a. Monday's notes b. $\int_0^{\ln 2} \sqrt{1+(3\sinh 3x)^2} dx$ c. $\int_0^{1/2} \sqrt{1+\left(\frac{1}{\sqrt{1-x^2}}\right)^2} dx$
11. a. $\int_1^2 2\pi\left(\frac{2}{3}(x-1)^{3/2}\right)\sqrt{1+(\sqrt{x-1})^2} dx$ b. $\int_0^{\ln 2} 2\pi \cosh 3x \sqrt{1+(3\sinh 3x)^2} dx$
 c. $\int_0^{1/2} 2\pi \arcsin x \sqrt{1+\left(\frac{1}{\sqrt{1-x^2}}\right)^2} dx$
12. a. $\int_{-2}^2 (8-2x^2)^2 dx = \frac{2048}{15}$ b. $\int_{-2}^2 \frac{\pi}{8}(8-2x^2)^2 dx = \frac{256\pi}{15}$
13. a. $\ln|y+5| = \frac{x^2}{2} + 2x + C$ or $y = ke^{x^2/2+2x} - 5$ b. $y^2 = 2e^x + C$ c. $\ln|y| = \frac{x^2}{2} - x + C$ or $y = ke^{x^2/2-x}$
14. $\ln|y-2| = x + \ln 4$ or $y = 4e^x + 2$
15. $k = \frac{\ln(3/2)}{4}, t = \frac{4\ln 3}{\ln(3/2)}$ hours
16. $\frac{12500\ln(1.94)}{\ln 2} \approx 11857.5$ yrs
17. $r = \frac{\ln 2}{15}$
18. $A(t) = 500e^{t\ln(1.3)}$

19.

a. Wednesday's notes

b. $\int_0^1 \frac{1}{e^x} dx$ – not improper

c. $\int_0^4 \frac{1}{\sqrt{4-x}} dx = \lim_{b \rightarrow 4^-} \int_0^b (4-x)^{-1/2} dx = \dots = -4$

d. Wednesday's notes

e. $\int_{-1}^0 \frac{1}{1+x^2} dx$ – not improper

f. Wednesday's notes